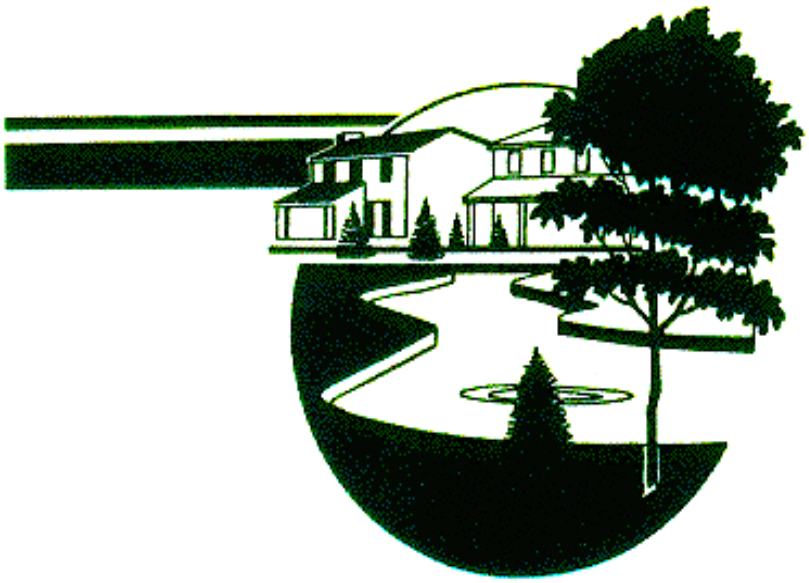
Protecting Water Quality



Missouri
Department of
Natural Resources

Stream and Channel Increases in the volume, velocity and time of runoff may cause erosion of the receiving stream or channel banks and bottom.

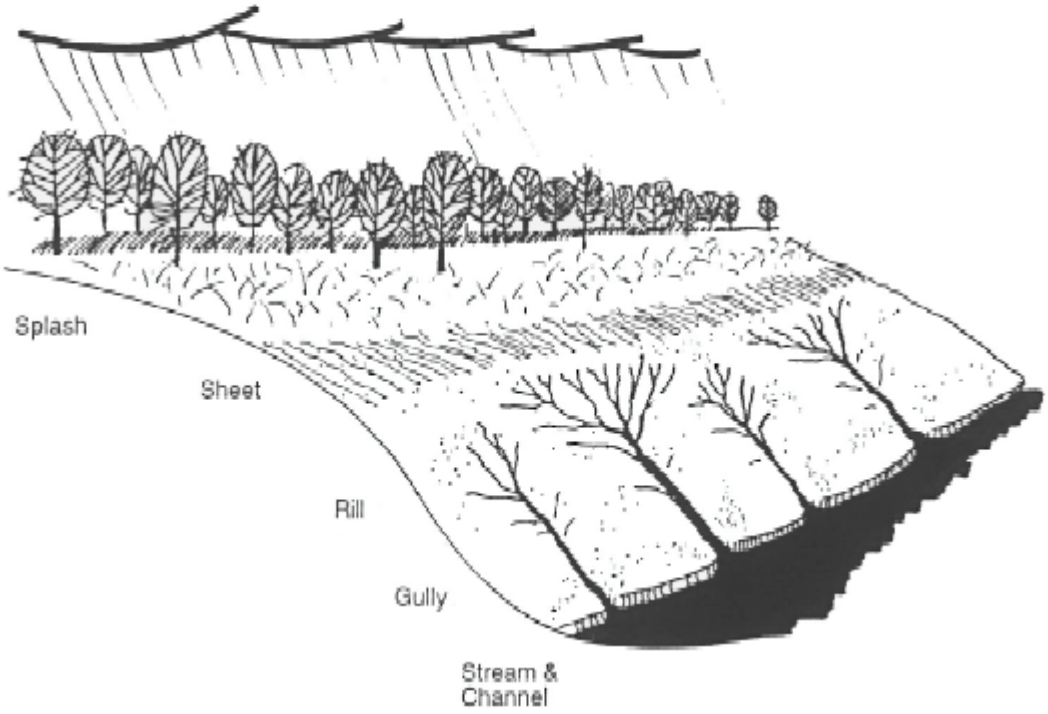


Figure 2.1 The Five Types of Soil Erosion on an Exposed Slope

Source: North Carolina DEHNR, 1993

Factors that Influence Water Erosion

The potential for a land area to erode is determined by several key factors: climate, rainfall, soil erodibility, and the length and steepness of the slope. These factors are interrelated in their effect on the potential for erosion. The variability in terrain and soils makes erosion control unique to each development site.

A site specific soils analysis and the assistance of a registered design professional (see *Glossary*) can aid in the development of an effective erosion, sediment and stormwater control plan.

- **Geotextile Fabric:** An underliner of woven geotextile (fabric) may be used under wet conditions to provide stability

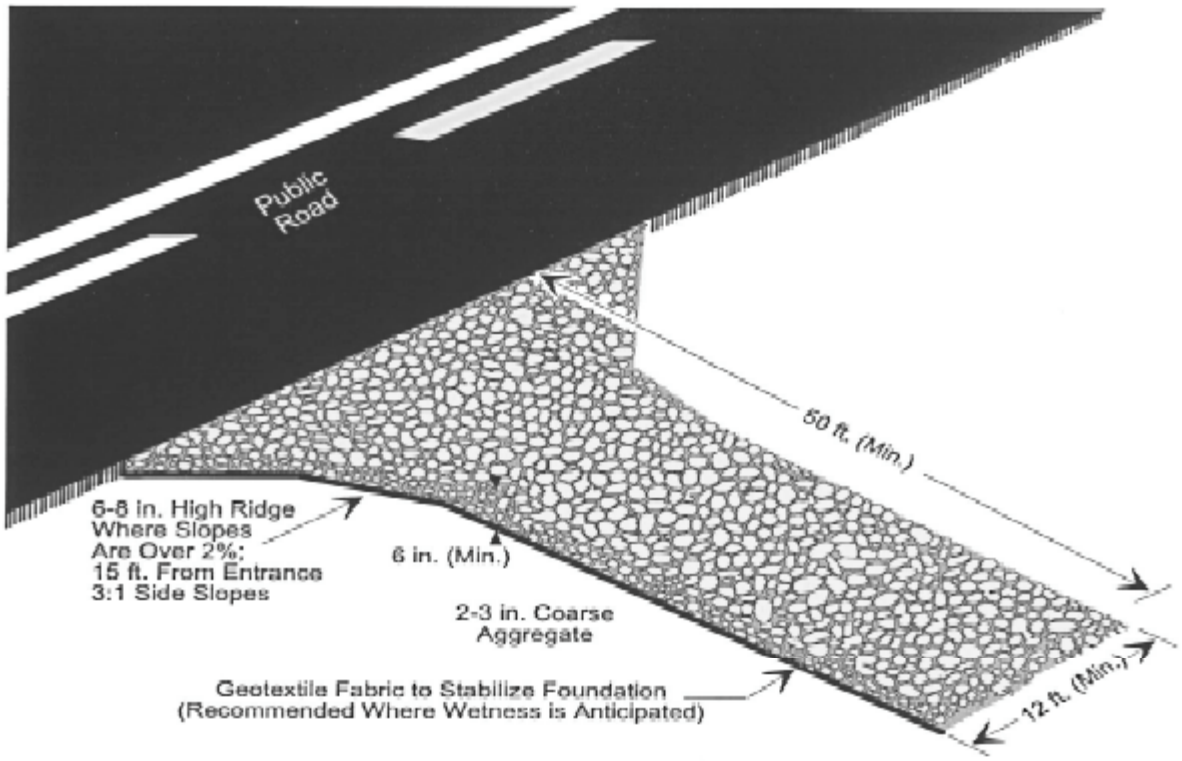


Figure 5.1 Typical Temporary Gravel Construction Entrance

Construction Avoid locating on steep slopes or at curves on public roads. If possible, locate where permanent roads will eventually be constructed.

Site Preparation Remove all vegetation and other unsuitable material from the foundation area, grade and crown for positive drainage.

Grading If slope towards the road exceeds 2%, construct a 6- to 8-inch high ridge with 3:1 side slopes across the foundation approximately 15 feet from the entrance to divert runoff away from the public road.

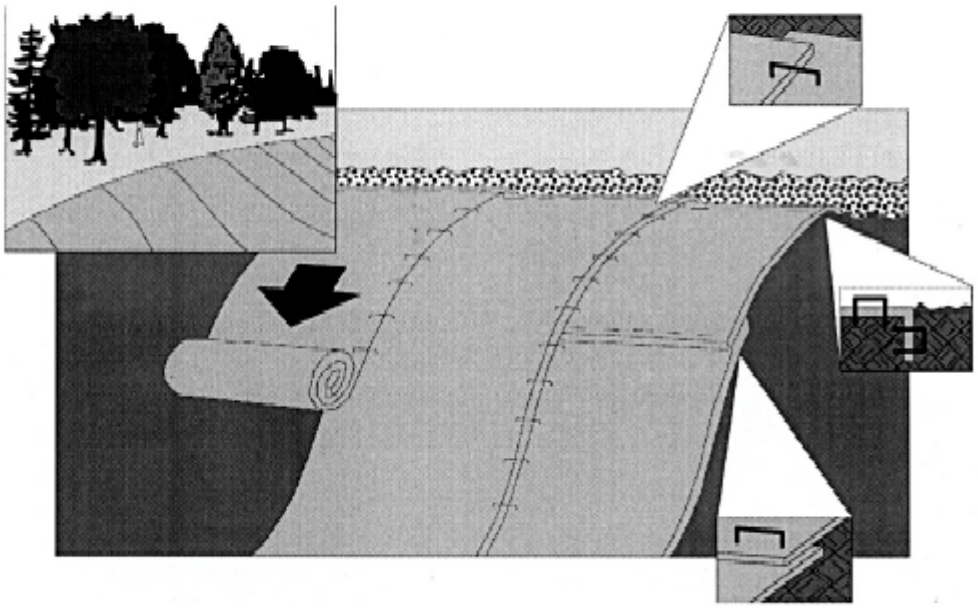


Figure 5.7 Typical Installation of Erosion Control Blankets on a Slope *

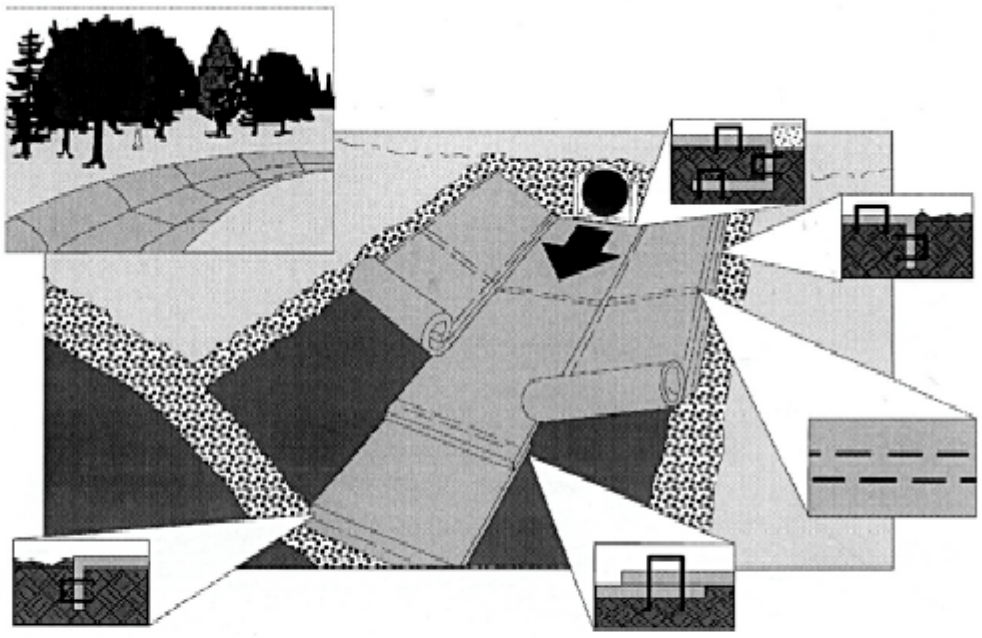


Figure 5.8 Typical Installation of Erosion Control Blankets in a Channel *

* Consult manufacturer for recommendations on proper installation of staple patterns.

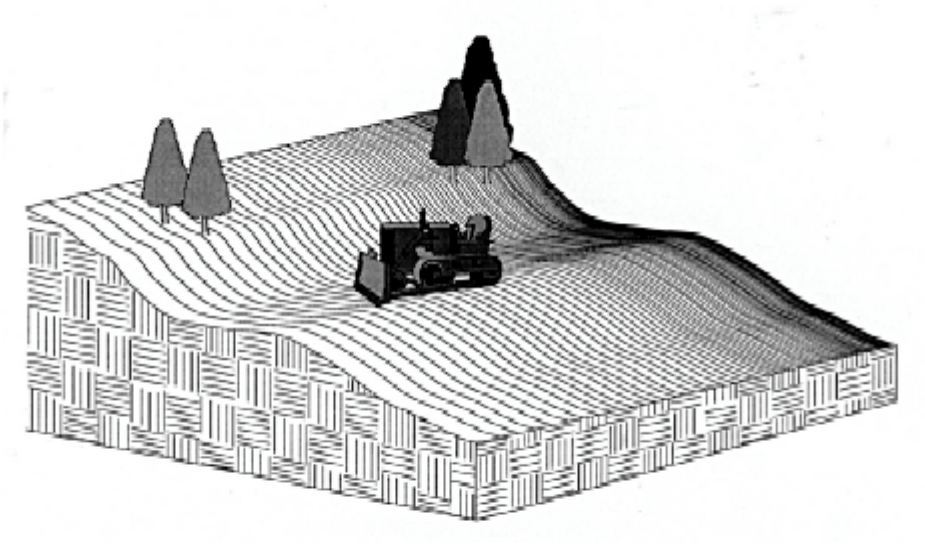


Figure 5.9 Typical Slope Break

Permanently stabilize graded areas immediately after final grading is completed. Use temporary stabilization measures on graded areas when work is to be interrupted or delayed for 30 working days or longer.

Construction Verification

Check all finished grades for conformance with grading plan and correct as necessary.

Troubleshooting

Consult with design professional if any of the following occur:

- Variations in topography on site indicate grading plan will be ineffective or unfeasible.
- Seepage is encountered during construction. It may be necessary to install drains.
- Design specifications for seed variety, seeding dates or erosion control materials cannot be met. Substitutions may be required. Unapproved substitutions could result in erosion and lead to failure of erosion control measures.

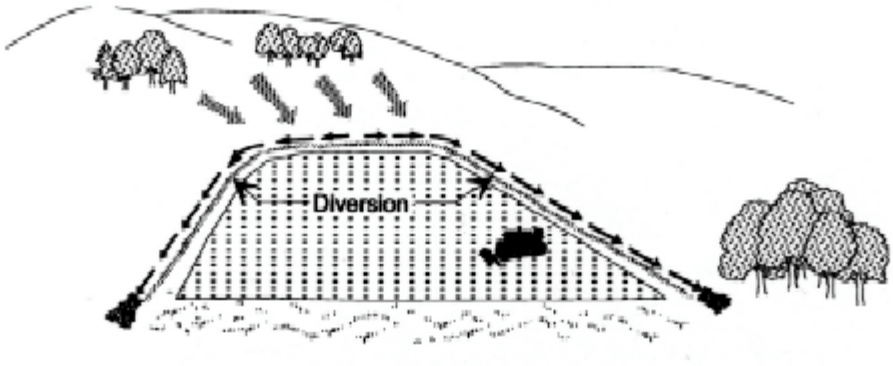


Figure 5.16 Typical Perimeter Protection

- **Channel Design:**
  Shape: Trapezoidal, Parabolic or V-shaped
  Side Slopes: 2:1 or flatter; 3:1 or flatter where vehicles must cross
  Stabilization: As specified in the design plan; based on velocity by reaches
  Grade: Stable, positive grade towards outlet, but not exceeding 2%

- **Outlet:** Stable, with sediment-laden water diverted to a sediment trap or basin; and runoff from undisturbed areas diverted to a stable natural outlet or outlet stabilization structure

Construction

Site Preparation

Determine exact location of any underground utilities.

Remove all trees, brush, stumps or other debris from the site, and dispose of properly.

Fill and compact all ditches or gullies to be crossed.

Scarify the base of the berm before placing the fill.

Grading

Fill the berm higher than the design elevation , and compact with wheels of the construction equipment to design height plus 10%.

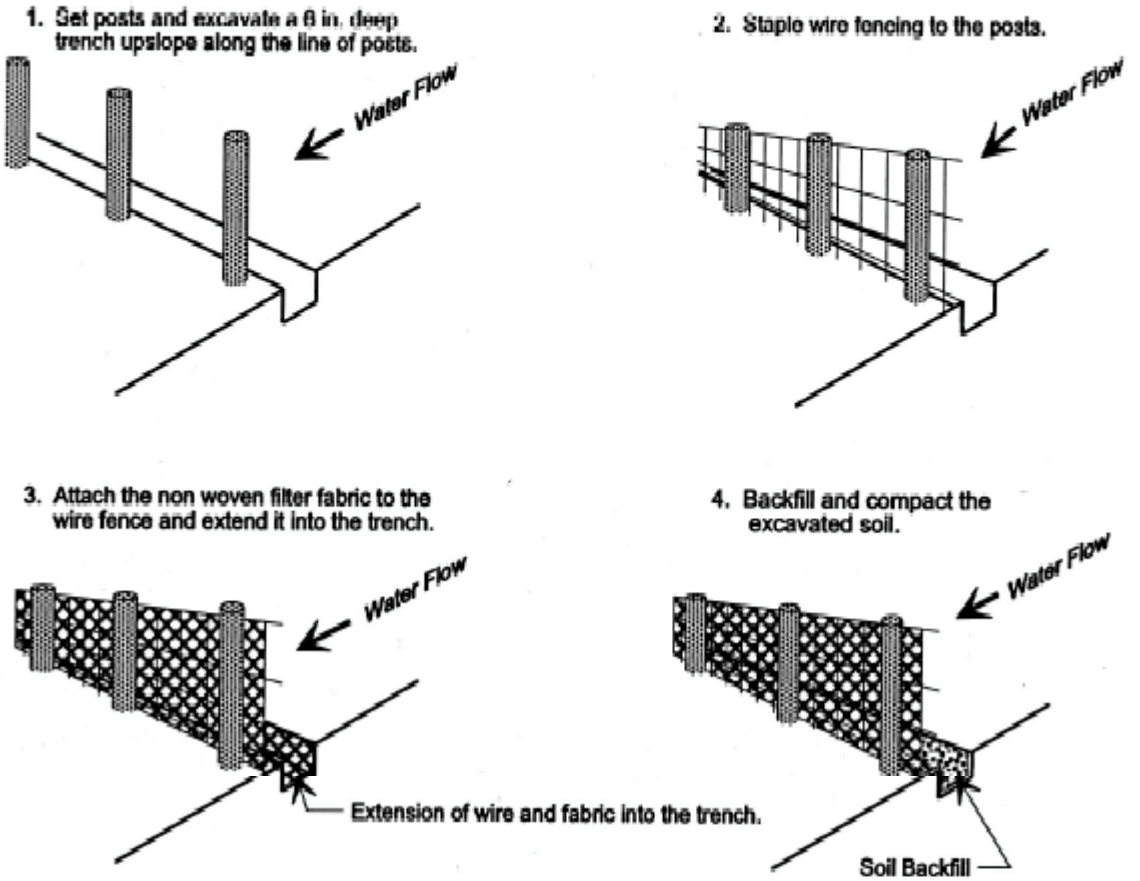


Figure 5.33 Installation of Sediment Fence

Construction

Site Preparation

Determine exact location of underground utilities.

Grade alignment of fence as needed to provide broad, nearly level area upstream of fence.

Fence Installation

Dig a trench at least 6 inches deep along the fence alignment as shown in Figure 5.33.

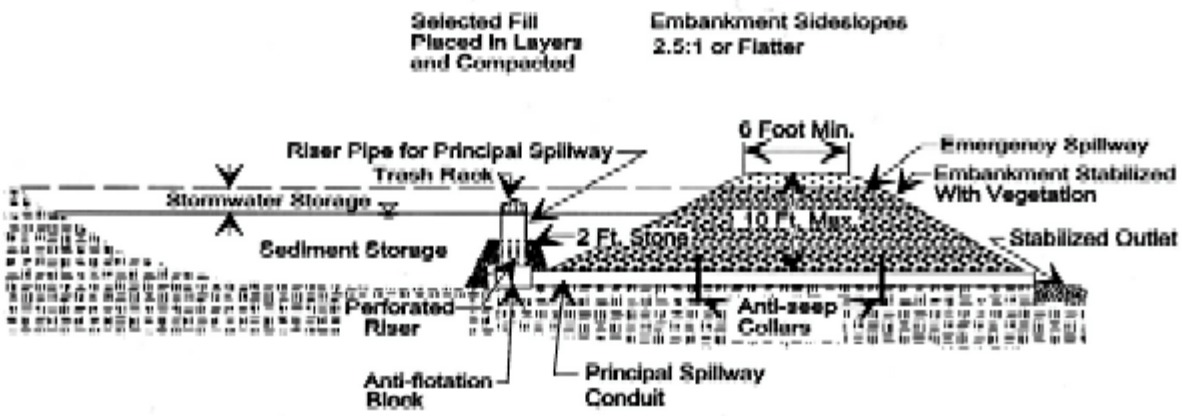


Figure 5.42 Typical Sediment Basin

Construction

Locate the sediment basin as close to the sediment source as possible, considering soil type, pool area, dam length and spillway conditions.

Site Preparation

Locate all utilities at the site.

Follow all federal, state and local requirements on impoundments.

Clear, grub and strip the dam foundation, removing all woody vegetation, rocks and other objectionable material.

Dispose of trees, limbs, logs and other debris in designated disposal areas.

Excavate the foundation (outlet apron first), stockpiling any surface soil having high amounts of organic matter for later use.

Principal Spillway

Clear the sediment pool to facilitate sediment clean out.

Situate the spillway barrel (pipe) and riser on a firm, even foundation. Prepare the pipe bedding.

Partial Exfiltration System

A partial exfiltration system contains an underground drainage system. The system should include regularly spaced, perforated pipes located in shallow depressions. The pipes collect the runoff and direct it to an infiltration basin or a central outlet.

The size and spacing of the underdrain network should allow passage of the 2-year storm event or the design storm.

Set the underdrain pipes near the top of the stone reservoir to allow the reservoir to totally fill before any water is discharged from the underdrain.

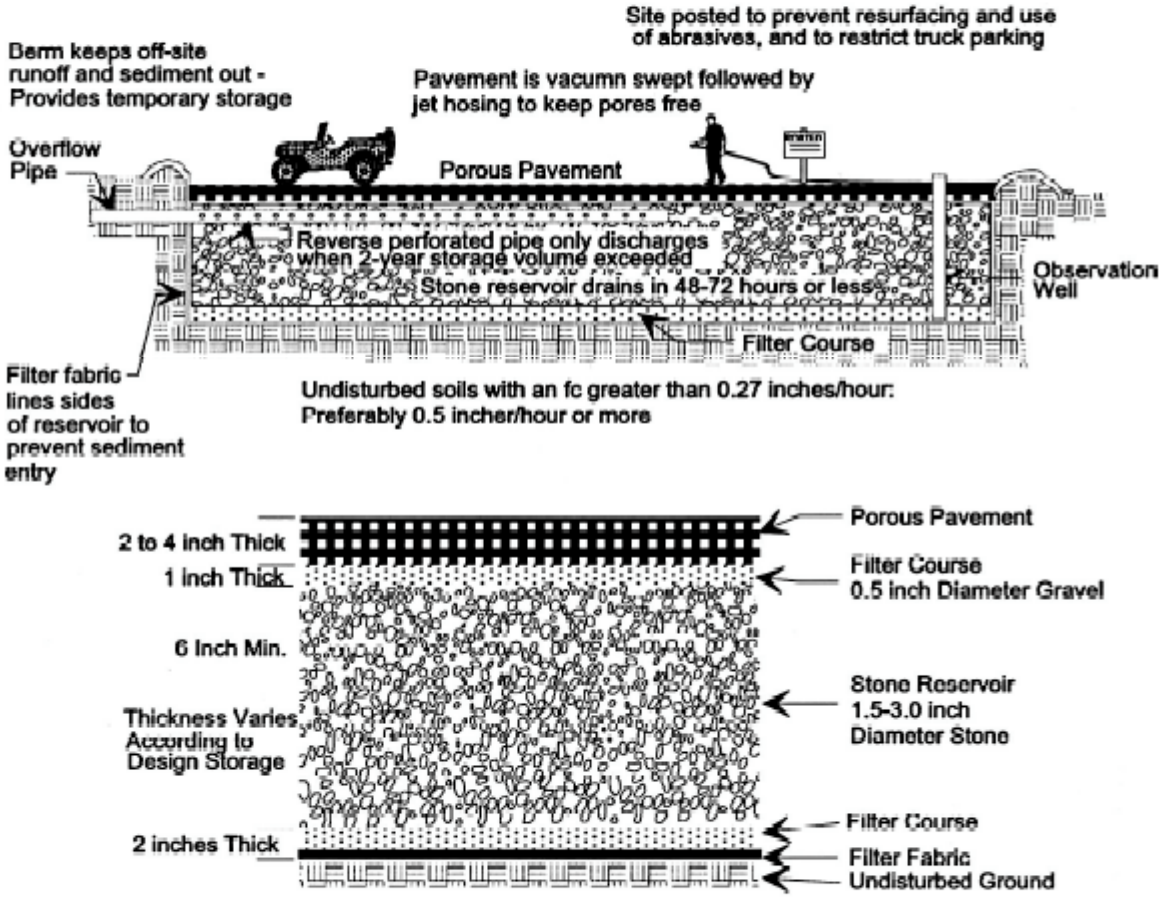


Figure 5.47 Typical Porous Pavement Design

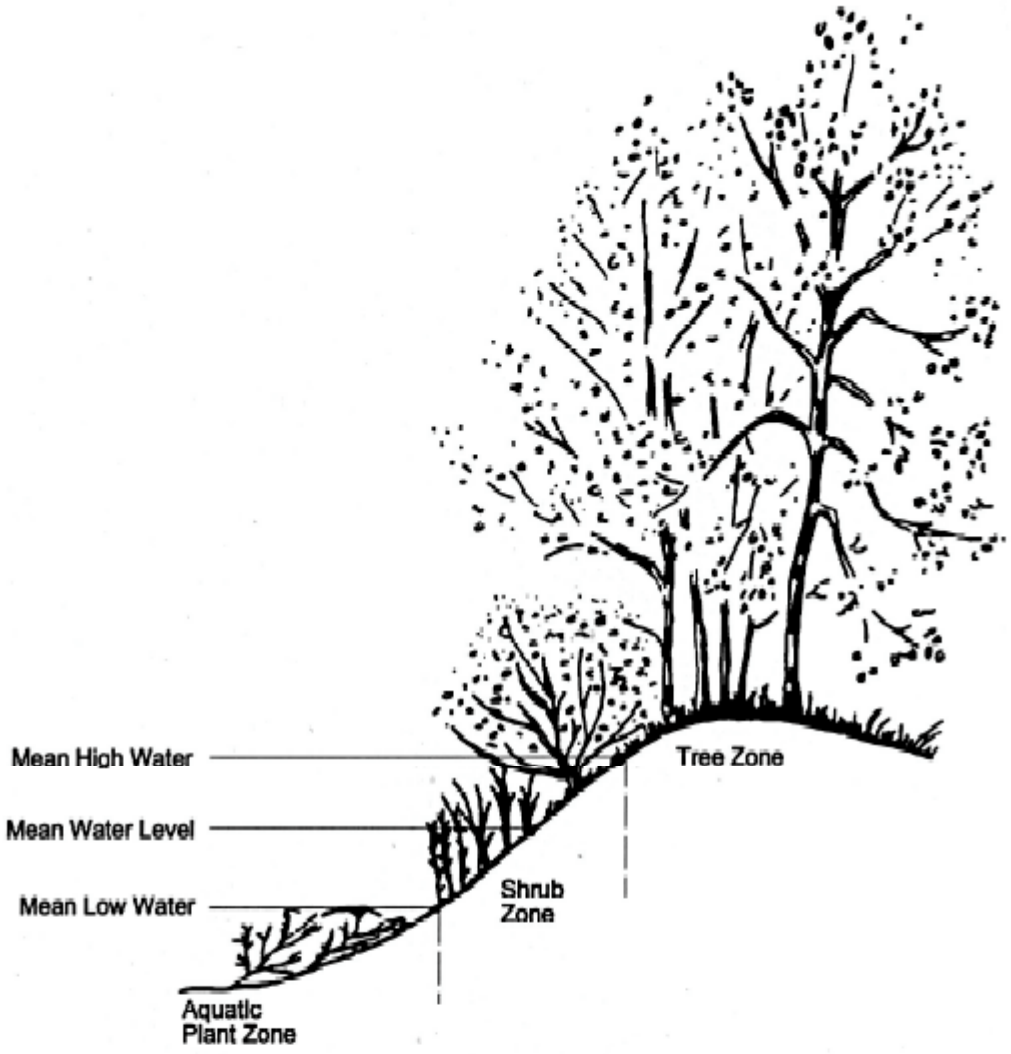


Figure 5.52 Vegetative Zones for Streambank Protection

Some grasses can be planted in the shrub zone if velocities are not too high and plants are not submersed frequently or for long periods of time. Plant grasses in the spring or the fall.